

TC-Link[®] 1CH-LXRS[®]

1 Channel Wireless Thermocouple Node



TC-Link[®]1CH-LXRS[®] - small, specialized node designed for data acquisition from standard thermocouples

LORD MicroStrain[®] LXRS[®] Wireless Sensor Networks enable simultaneous, high-speed sensing and data aggregation from scalable sensor networks. Our wireless sensing systems are ideal for sensor monitoring, data acquisition, performance analysis, and sensing response applications.

The **gateways** are the heart of the LORD MicroStrain wireless sensing system. They coordinate and maintain wireless transmissions across a network of distributed wireless sensor **nodes**. The LORD MicroStrain LXRS wireless communication protocol between LXRS nodes and gateways enable high-speed sampling, ± 32 microseconds node-to-node synchronization, and lossless data throughput under most operating conditions.

Users can easily program nodes for data logging, continuous, and periodic burst sampling with the **Node Commander[®]** software. The web-based **SensorCloud[™]** interface optimizes data aggregation, analysis, presentation, and alerts for gigabytes of sensor data from remote networks.

Product Highlights

- Standard mini thermocouple input and an embedded cold junction temperature compensation sensor
- On-board linearization algorithms are software programmable to support a wide range of thermocouple types, including J, K, N, R, S, T, E, and B
- Small form factor, low power consumption, and wireless framework optimizes deployment in remote and long-term monitoring applications.
- High resolution data with 24-bit A/D converter

Features and Benefits

High Performance

- Lossless data throughput and node-to-node sampling synchronization of $\pm 32 \mu\text{s}$ in LXRS-enabled modes
- Support for hundreds of simultaneous sampling wireless sensor nodes
- Wireless range up to 2 km (800 m typical)

Ease of Use

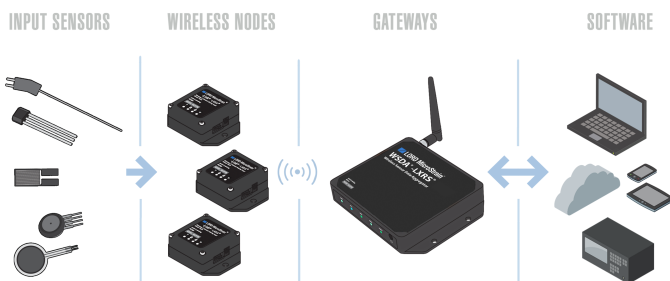
- Rapid deployment with wireless framework
- Standard miniature thermocouple blade connector
- Remotely configure nodes, acquire and view sensor data with Node Commander[®].
- Easy custom integration with comprehensive SDK

Cost Effective

- Reduction of costs associated with wiring
- Volume discounts

Applications

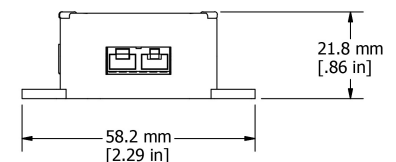
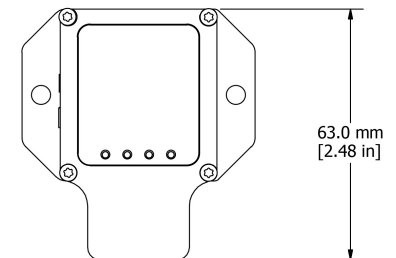
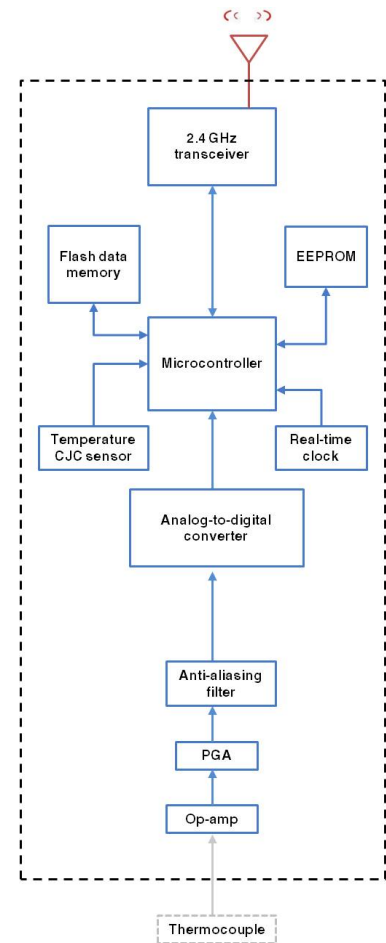
- Thermal profiling
- Refrigeration monitoring
- Production process monitoring
- Quality control
- Environmental monitoring



Wireless Simplicity, Hardwired Reliability[™]

Specifications

General	
Sensor input channels	Thermocouple input, 1 channel
Integrated sensors	Temperature CJC, 1 channel
Data storage capacity	2 Megabytes (up to 500,000 data points)
Thermocouple Input	
Measurement range	-210 °C to 1820 °C (depending on the thermocouple type)
Accuracy	±0.1 % of full scale or ±2 °C, whichever is greater (does not include error from sensor or wire)
Resolution	0.0625 °C, 24 bit
Repeatability	±0.1 °C (does not include error from sensor or wire)
Integrated Temperature Cold Junction Compensation (CJC) Channel	
Compensation range	-40 °C to 85 °C
Accuracy	±0.5 °C (from 0 to 70 °C)
Resolution	12 bit
Sampling	
Sampling modes	Synchronized, low duty cycle, datalogging
Sampling rates	Continuous sampling: 1 sample/hour to 64 Hz Datalogging: 1 sample/hour to 64 Hz
Sample rate stability	±3 ppm
Network capacity	Up to 2000 nodes per RF channel (and per gateway) depending on the number of active channels and sampling settings. Refer to the system bandwidth calculator: http://www.microstrain.com/configure-your-system
Synchronization between nodes	±32 µsec
Operating Parameters	
Wireless communication range	Outdoor/line-of-sight: 2 km(ideal)*, 800 m (typical)** Indoor/obstructions: 50 m (typical)**
Radio frequency (RF) transceiver carrier	2.405 to 2.470 GHz direct sequence spread spectrum over 14 channels, license free worldwide, radiated power programmable from 0 dBm (1 mW) to 16 dBm (39 mW); low power option available for use outside the U.S. - limited to 10dBm (10mW)
RF communication protocol	IEEE 802.15.4
Power source	Internal: 3.7 V dc, 250 mAh, rechargeable Lithium polymer battery, External: 3.2 V dc to 9 V dc
Power consumption	See power profile : http://files.microstrain.com/TC-Link-1CH-LXRS-Power-Profile.pdf
Operating temperature	-20 °C to +60 °C (extended temperature range available with custom battery/enclosure, -40 °C to +85 °C electronics only)
Acceleration limit	500 g standard (high g option available)
Physical Specifications	
Dimensions	63 mm x 58 mm x 21 mm
Weight	49 grams
Enclosure material	ABS plastic
Environmental rating	Indoor use (unless mounted in a sealed enclosure)
Integration	
Compatible gateways	All WSDA [®] base stations and gateways
Compatible sensors	Type J, K, N, R, S, T, E and B thermocouples
Connectors	Type-1 standard mini (SM) connectors for flat pin thermocouples
Software	SensorCloud [™] , SensorConnect [™] , Node Commander [®] , WSDA [®] Data Downloader, Live Connect [™] , Windows XP/Vista/7 compatible
Software development kit (SDK)	Data communications protocol available with EEPROM maps and sample code (OS and computing platform independent) http://www.microstrain.com/wireless/sdk
Regulatory compliance	FCC (U.S.), IC (Canada), ROHS



*Measured with antennas elevated, no obstructions, and no RF interferers.

**Actual range varies depending on conditions such as obstructions, RF interference, antenna height, & antenna orientation.